

FCC MAIL SECTION

DEC 31 12 57 PM '92 Before the  
Federal Communications Commission  
Washington, D.C. 20554

MM Docket No. 92-305

In the Matter of

Amendment of the rules	RM-8066
relating to permissible	RM-8067
uses of the vertical	
blanking interval of broadcast	
television signals	

**NOTICE OF PROPOSED RULE MAKING**

Adopted: December 18, 1992; Released: December 31, 1992

Comment Date: March 1, 1993

Reply Comment Date: March 16, 1993

By the Commission:

**INTRODUCTION**

1. By this *Notice of Proposed Rule Making*, we propose to amend Sections 73.682 and 73.699 of our rules to permit optional transmission of expanded closed-captioning<sup>1</sup> and other types of information using all of line 21, field 2, of the vertical blanking interval of broadcast television signals. We also propose to reserve use of line 19 of the vertical blanking interval for the optional use of a ghost-cancelling reference (GCR) signal.

<sup>1</sup> Closed-captioning is the video display of aural program material in a textual format. This process primarily benefits deaf or hearing-impaired individuals. Pursuant to §73.682(a)(22), closed-captioning information may be transmitted on line 21, field 1 and the first half of line 21, field 2 of the vertical blanking interval. Standard television pictures are transmitted at a rate of 30 frames per second, with two interlaced fields comprising each frame. Each field begins with a vertical blanking interval of twenty-one lines, during which the picture scanning beam is turned off (blanked) and is moved from the bottom of the screen to its starting position at the top of the screen. Thus, there are two vertical blanking intervals transmitted per frame, one in each field. The placement of data within the vertical blanking interval is described in terms of the particular blanking line used and the field (one or two) in which it occurs.

<sup>2</sup> EIA/CEG's membership includes most of the world's large consumer electronics manufacturers as well as smaller companies that produce, import, distribute, sell and service electronic products.

<sup>3</sup> *Amendment of Part 15 of the Commission's Rules to Implement the Provisions of the Television Decoder Circuitry Act of 1990*, 6 FCC Rcd 2419, (1991). Briefly stated, the action taken in that proceeding requires that all television broadcast receivers with

**BACKGROUND**

2. On July 7, 1992, the Consumer Electronics Group of the Electronic Industries Association (EIA/CEG<sup>2</sup>) filed a Petition for Rule Making (EIA/CEG Petition) seeking designation of line 21, field 2 of the vertical blanking interval for enhanced closed-captioning services. This petition was filed in response to an invitation made by the Commission in the *Report and Order (Order)* in Gen. Docket No. 91-1<sup>3</sup> in which the Commission noted that Public Broadcasting Service/National Captioning Institute (PBS/NCI) specifications permit two distinct channels of captioning information to be transmitted, either to caption in two different languages or for two different reading levels. However, comments received indicated that the current (captioning) data rate is insufficient to caption two channels simultaneously, but that this problem could be resolved if all of line 21, field 2 could be used.<sup>4</sup> The Commission indicated that assigning the second half of line 21, field 2 for closed-captioning was outside the scope of that proceeding and that the views of a broader range of commenters (such as broadcasters, cable operators and video programmers) should be sought in the matter. Accordingly, we invited EIA/CEG or other interested parties to file such a petition.<sup>5</sup> EIA/CEG responded to that request.

3. In addition, on August 14, 1992, the United States Advanced Television Systems Committee (ATSC)<sup>6</sup> filed a Petition for Rule Making (ATSC Petition) which requests that Section 73.682(a)(21)(iv) of the Commission's Rules be amended to substitute a GCR signal on line 19 of the NTSC<sup>7</sup> vertical blanking interval, in place of the vertical interval reference (VIR) signal for which that line is currently reserved.

4. Because each of the petitions mentioned above is directed at improving the quality of television service through new or modified uses of the vertical blanking interval, and because neither of the two petitions appears to involve any significant technical difficulty, we believe that a consolidated rulemaking proceeding would expedite their resolution and facilitate introduction of these new technologies to the American public.

picture screens 13 inches or larger shipped in interstate commerce, manufactured, assembled or imported from any foreign country into the United States after June 30, 1993, must be equipped with a closed-captioning decoder. The Act (as implemented in 47 C.F.R. §15.119) requires only that line 21, field 1 be decoded. Therefore we are not proposing that TV receivers subject to the Act be equipped with enhanced closed-captioning decoders. However, we believe that the prompt action we are taking on EIA/CEG's petition will provide TV manufacturers with an opportunity to produce as many receivers as possible with enhanced closed-captioning decoding capability.

<sup>4</sup> *Id.*, at 2431.

<sup>5</sup> *Id.*

<sup>6</sup> ATSC is a private-sector organization whose charter and terms of reference provide for the voluntary standardization of advanced television technologies. Its membership is broadly constituted among the industries most affected by advanced television: broadcasting, cable, satellite, manufacturing and motion picture production.

<sup>7</sup> The current U.S. television system is referred to as the NTSC system, named for the National Television Systems Committee that advised the Commission on television technical standards in the '40s and '50s.

### The Petitions

5. *Line 21.* Since the issuance of the *Order*, EIA/CEG states that it has been working with receiver manufacturers, decoding circuitry manufacturers, program providers, caption providers and other organizations to arrive at a substantial consensus on the best use of line 21, field 2. As a result of these discussions, EIA/CEG concludes that all of line 21, field 2 should be made available for additional captioning channels as well as an "extended data service" that could include program identification, program schedules and other information that could be valuable to all consumers, including but not limited to people with hearing disabilities. Under this proposal, caption information would continue to have priority, as the present rules already specify in the case of field 1, but other data could be carried on a "space available basis."

6. EIA/CEG notes that the second half of line 21, field 2 is currently unavailable for use by caption and other data services and that the format currently specified for the first half of field 2 is not used by the decoding circuitry that is being incorporated in television receivers or by existing stand-alone decoders.<sup>8</sup> It proposes that the same data format be used for field 2 as has already been established for field 1.<sup>9</sup>

7. *Line 19.* In support of its petition, ATSC notes that while VIR provisions were adopted by the Commission in 1974 to facilitate automatic color adjustments in TV receivers, effective implementation of the VIR signal within the broadcast and receiver manufacturing industries did not occur to a sufficient extent that cognizable benefits were provided to consumers. This was due largely to advances made in chroma circuitry based on the regular color burst signal. ATSC indicates that only one manufacturer, General Electric, produced any significant quantity of VIR-equipped receivers and that such production ceased in 1985. ATSC believes that few such receivers remain in use and that they are capable of continued satisfactory operation in the absence of the VIR signal.

8. ATSC contends that further reservation of line 19 for VIR signals represents inefficient use of vertical blanking interval capacity and that the public interest would be better served by the introduction of ghost-reduction circuitry. Therefore, it believes that GCR signals should replace the VIR signal on line 19. While ATSC requests that transmission of the GCR signal be at the option of the broadcaster, it asks the Commission to adopt the specific ghost-cancelling system developed by Philips Laboratory (Philips).

### Discussion

9. We believe the objectives and rationale presented in both the EIA/CEG Petition and the ATSC Petition have merit. Of particular importance in the former petition is the fact that the first half of line 21, field 2 has not been utilized in its current technical configuration. We agree with the petitioner that reconfiguration of line 21, field 2 to provide enhanced closed-captioning (whether it be for a second language or a higher level of captioning quality) would appear to serve the public interest. This change can not only enhance closed-captioning for hearing-impaired persons, but also expand various captioning uses for non hearing-impaired persons as well. We also believe that EIA/CEG's proposed distinction in the priority of use (with non-captioning uses permitted only on a secondary basis) of line 21 may be appropriate.

10. The second half of line 21, field 2 is ostensibly in the visible portion of the TV signal. We believe that this is not cause for concern, however, because the scanning beam in every TV receiver available to date "overscans" the visible picture by several lines on the top and the bottom of the screen.<sup>10</sup> Line 22 (also part of the active video) has been used for several years for program source identification signaling. Since initiation of this use, no complaints of picture degradation have been received.

11. In sum, both EIA/CEG's petition and our own experience indicate that there is no likely adverse impact if we assign all of line 21, field 2 for enhanced closed-captioning and, on a secondary basis, other broadcast-related uses. We seek comment on the specific rule changes in attached Appendix A or on any unforeseen or overlooked problems or circumstances that exist which would argue for or against this proposal for the use of line 21, field 2. We also solicit comments on whether or not any adverse interaction may occur between line 21 and line 22 from the standpoint of line identification and decoding circuitry. If so, should the Commission make use of line 22 (which is used for "special signals"<sup>11</sup>) secondary to line 21?

12. Also, the National Captioning Institute (NCI), in comments filed in response to EIA/CEG's petition, supports the concept of an extended data service but recommends that the terms "captions," "text" and "extended data service information" in the proposed rule be defined in order to clarify the conditions under which they may be provided. NCI suggests that "captions" be defined as "a visual depiction of information simultaneously being provided on the audio portion of a television signal."<sup>12</sup> "Text" would be defined as "caption-related text" and "extended data service information" means "information that is neither a caption nor text." Comment is requested on whether these definitions are necessary or appropriate as a means of emphasizing which information services are secondary to captions on line 21.

<sup>8</sup> EIA/CEG cites the *Order* (note 25) which states "When closed captioning was first authorized, the first half of line 21, field 2 was used to transmit a barker code so that decoders could easily determine when closed-captioned information was transmitted. In practice, it was found that the barker code was unnecessary." EIA/CEG explains that no decoders were built that used the (barker) reference pulse and argues that reserving even limited spectrum for these obsolete purposes represents a waste of a valuable resource. (EIA/CEG Petition at note 10).

<sup>9</sup> EIA/CEG petition, p. 5.

<sup>10</sup> Overscanning is the deflection of the scanning beam beyond the mask on a television picture tube. The mask is usually part of the television cabinet and it covers a small part (the edges) of the picture.

<sup>11</sup> Such "special signals" were described in an April 12, 1970 Public Notice and may not be transmitted without specific authorization by the Commission. See 22 FCC 2d 779 (1970).

<sup>12</sup> The proposed definitions are those currently used by NCI. In an aside remark, NCI notes that "captioning" is "the process of creating captions."

13. With respect to ATSC's petition, we believe that while many advances in NTSC television quality have been made over the years, picture degradation through ghosting<sup>13</sup> may be the most significant reception defect yet to be eliminated or minimized. Ghosting is a widespread problem in most over-the-air TV reception and may even occur in a milder form in cable reception. Therefore, an effective system of reducing or eliminating ghosts would be a significant technical improvement which would be of direct benefit to viewers. It was for this reason, in large part, that the pertinent rule was suspended<sup>14</sup> on October 22, 1992, to permit over-the-air testing of ghost-reduction systems.

14. There are several issues requiring exploration in this matter. First, is there any significant use of the VIR signal today? As ATSC notes in its petition:

"For the VIR signal to be maximally effective for the consumer, the VIR signal must be added at the time the program is created and must remain unchanged during distribution of that program in a television distribution system. It was difficult for television stations to consistently apply the signal given the complexities of program production and distribution. And a mis-applied VIR signal could actually change the consumer's received color rendition for the worse."<sup>15</sup>

This statement indicates that VIR implementation has been far from complete. Nevertheless, we solicit additional comment on any current uses of the VIR and whether they should preclude its abandonment in favor of a GCR signal.

15. Second, ATSC asks that we embody the definition of the Philip's Laboratory GCR signal in an OET Bulletin with a reference to it being placed in the rules, inasmuch as ATSC membership agreed on the selection of Philip's GCR system as being the best of those tested. By this action the Commission would clearly ratify the industry's selection. We have taken similar action in the past, most notably when we adopted standards for TV stereo.<sup>16</sup> We solicit comment on this proposal and the specific rule changes contained in the attached Appendix A. We also ask whether or not flexibility and future improvements in ghost-cancelling technology would be hindered by this approach. Alternatively, we could simply reserve all of line 19 for use by ghost-cancelling reference signals without specifying any particular system. Lastly, we solicit comment on any other relevant circumstances or potential problems that may be associated with the implementation of the GCR reference signal on line 19.

<sup>13</sup> Ghosting is caused by reflections in the path of the TV signal. In most cases of ghosting, the strong primary signal travels in the most direct path between the TV transmitter and the receiver. However, because the signal is radiated in all directions, signals emitted in other directions can reflect off hills, buildings and other objects (including passing airplanes) and arrive at the receiving antenna slightly behind the main signal (the delay is due to the additional distance the signals must travel). This results in a trailing ghost (i.e., a fainter image or "ghost" to the right of the desired image). Multiple ghosts are caused by the reception of multiple reflected signals. A leading ghost (i.e., a fainter image or "ghost" to the left of the desired

## Conclusion

16. As stated above, significant benefits can be derived by prompt action in this rule making. TV manufacturers are currently designing receivers equipped with closed-captioning circuitry mandated by the Television Decoder Circuitry Act of 1990 (Pub. L. 101-431) as implemented in Section 15.119 of our Rules. The earlier we can act on the proposals discussed herein, the less disruptive it will be for manufacturers already planning their compliance with this requirement and the sooner televisions equipped with these features can be made available to the public. Therefore, to bring these improvements to the public with a minimum of delay, we establish below relatively short deadlines for filing comments and reply comments. Extensions of the comment and reply comment deadlines will require substantial justification, as we desire to proceed to the *Report and Order* phase of this proceeding as soon as possible.

## ADMINISTRATIVE MATTERS

### Ex Parte Rules -- Non-Restricted Proceeding

17. This is a non-restricted notice and comment rulemaking proceeding. *Ex parte* presentations are permitted, except during the Sunshine Agenda period, provided they are disclosed as provided in Commission rules. See generally 47 C.F.R. §§1.1202, 1.1203 and 1.1206(a).

### Comment Information

18. Pursuant to applicable procedures set forth in §§ 1.415 and 1.419 of the Commission's Rules, interested parties may file comments on or before **March 1, 1993** and reply comments on or before **March 16, 1993**. All relevant and timely comments will be considered by the Commission before final action is taken in this proceeding. To file formally in this proceeding, participants must file an original and four copies of all comments, reply comments, and supporting comments. If participants want each Commissioner to receive a personal copy of their comments, an original plus nine copies must be filed. Comments and reply comments should be sent to the Office of the Secretary, Federal Communications Commission, Washington, D.C. 20554. Comments and reply comments will be available for public inspection during regular business hours in the Dockets Reference Room (Room 239) of the Federal Communications Commission, 1919 M Street, N.W., Washington, D.C. 20554.

### Regulatory Flexibility Act

19. An Initial Regulatory Flexibility Analysis is contained in Appendix B of this Notice of Proposed Rule Making.

image) may be caused by pickup of a signal in the receiver's tuner circuits which arrives before the main signal delivered by the antenna.

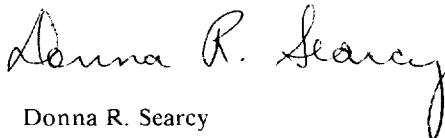
<sup>14</sup> See *Order*, "Suspension of Section 73.682(a)(21)(iv) of the Commission's Rules to Permit Additional Use of Line 19 of the TV Vertical Blanking Interval," 7 FCC Red 7158 (1992).

<sup>15</sup> ATSC Petition, p. 5.

<sup>16</sup> The Commission took similar action with respect to its selection of a specific TV stereo system. Reference is made to the "BTSC system of stereophonic sound transmission" in Section 73.682(c)(3) of the Rules, the specifications of which are described in detail in OST Bulletin No. 60.

**Additional Information**

20. For additional information on this proceeding, contact James E. McNally, Jr., Mass Media Bureau, (202) 632-9660.

**FEDERAL COMMUNICATIONS COMMISSION**


Donna R. Searcy  
Secretary

**APPENDIX A**

We propose to amend Title 47 of the Code of Federal Regulations as follows:

1. The authority citation for Part 73 continues to read as follows:

**Authority: 47 U.S.C. 154 and 303**

2. Section 73.682 would be amended by revising paragraphs (a)(21)(iv) and (a)(22)(i), (a)(22)(i)(A), (a)(22)(i)(B) and by removing paragraphs (a)(22)(i)(C) and (a)(22)(i)(D) as follows:

**§73.682 TV transmission standards.**

(a) \* \* \*

(21) \* \* \*

(iv) Regardless of other provisions of this paragraph, Line 19, in each field, may be used only for the transmission of the ghost-cancelling reference signal described in OET Bulletin No. \_\_\_\_\_.

(22)(i) Line 21, in each field, may be used for the transmission of a program-related data signal which, when decoded, provides a visual depiction of information simultaneously being presented on the aural channel (captions). Such data signal shall conform to the format described in Figure 16 of §73.699 and may be transmitted during all periods of regular operation. On a space available basis, line 21 field 2 may also be used for additional text and extended data service information.

*Note: The signals on Fields 1 and 2 shall be distinct data streams, for example, to supply captions in different languages or at different reading levels.*

(A) A decoder test signal consisting of data representing a repeated series of alphanumeric characters may be transmitted at times when no program-related data is being transmitted.

(B) The data signal shall be coded using a non-return-to-zero (NRZ) format and shall employ standard ASCII 7 bit plus parity character codes.

*Note: For more information on data formats and specific data packets, see EIA-608, "Line 21 Data Services for NTSC," available from the Electronics Industries Association.*

\* \* \* \* \*

3. Section 73.699 would be amended by removing Figures 16, 17B, 17C and by redesignating Figure 17A as Figure 16.

**APPENDIX B****INITIAL REGULATORY FLEXIBILITY ANALYSIS**

As required by §603 of the Regulatory Flexibility Act, the Commission has prepared the following Initial Regulatory Flexibility Analysis (IRFA) of the expected impact on small entities of the proposals suggested in this document. Written public comments are requested on the IRFA. These comments must be filed in accordance with the same filing deadlines as comments on the rest of the *Notice*, but they must have a separate and distinct heading designating them as responses to the Regulatory Flexibility Analysis. The Secretary shall send a copy of this *Notice of Proposed Rule Making*, including the IRFA, to the Chief Counsel for Advocacy of the Small Business Administration in accordance with paragraph 603(a) of the Regulatory Flexibility Act (Pub. L. No. 96-354, 94 Stat. 1164, 5 U.S.C. § 601 *et seq.* (1981)).

**Reason for Action**

The purpose of this *Notice* is to consider changes in the use of the vertical blanking interval of broadcast television signals.

**Objectives**

This action is intended to improve the general quality of television service by providing for enhanced closed-captioning service and, secondary to that, other broadcast-related information services capable of depiction in an alphanumeric format. Additionally, the rules proposed would permit the transmission of a special ghost-cancelling reference signal that when used with TV receivers having the proper decoding circuitry, could eliminate much, if not all, picture degradation due to the reception of reflected, low amplitude TV signals.

**Legal Basis**

Authority for the actions proposed in this *Notice* may be found in Sections 4 and 303 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154 and 303.

**Reporting, Recordkeeping, and Other Compliance Requirements**

None.

**Federal Rules which Overlap, Duplicate, or Conflict with the Proposed Rule**

None.

**Description, Potential Impact and Number of Small Entities Involved**

The services permitted by the new rules are entirely optional in character. However, their appeal to the public is likely to be such that most TV broadcast licensees will want to obtain the equipment with which to provide them. Thus, as a practical matter, the new rules would have an impact on some 1,500 licensees.

**Any Significant Alternatives Minimizing the Impact on Small Entities and Consistent with the Stated Objectives**

There are none.